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10.—The genus *Ctenotus* (Lacertilia, Scincidae) in the Eastern Division of Western Australia.

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Abstract

The following 19 taxa are defined and keyed out: *pantherinus ocellifer* (Boulenger), *grandis* sp. nov., *helenae* sp. nov., *lesueurii* (Duméril & Bibron), *severus* sp. nov., *leonhardii* (Sternfeld), *uber* sp. nov., *mimetes* sp. nov., *dux* sp. nov., *ariadnae* sp. nov., *quattuordecimlineatus* (Sternfeld), *atlas* sp. nov., *impar* sp. nov., *piankai* sp. nov., *leae* (Boulenger), *calurus* sp. nov., *colletti nasutus* subsp. nov., *schomburgkii* (Peters) and *brooksii* (Loveridge).

Introduction

Scarcity of material has long delayed the revision of *Ctenotus*, largest and least known of Australian reptile genera. Recently it has become not only possible but urgent to revise the species inhabiting the Eastern Division of Western Australia.

In late 1966 American herpetologist Dr E. R. Pianka set up several study areas in the southern half of the Division. Here he worked on various aspects of the ecology of desert lizards, in the course of which some hundreds of specimens of *Ctenotus* were collected. In order to provide Dr Pianka with names, old and new, I examined the greater part of his beautifully preserved

series, all the Eastern Division material in the Western Australian Museum, and the type specimens of most of the named taxa occurring in the Division. In addition some hundreds of specimens from neighbouring regions were examined, but unless indicated to the contrary data from these specimens were not used in descriptions.

Besides coloration the following measurements, counts and observations were made on all specimens: snout-vent length in mm (abbreviated to SVL); length of tail, foreleg and hindleg (all expressed as % SVL); nature of nasal and prefrontal contacts; number of supraciliaries, supraciliaries and scales along lower edge of upper eyelid (the last are referred to simply as "palpebrals"); ratio width to height of second loreal; number of upper labials; number and shape of ear lobules; number of enlarged dorsal scales on each side of neck (referred to simply as "nuchals"); number of longitudinal scale-rows round middle of body; number and nature of lamellae under fourth toe (here the term "calli" is used for thickenings too low and wide to be called keels). In the descriptions only ranges are given for quantitative characters; the means are brought together in Table 1.

Table 1

Number of specimens (number with original tail in brackets) and mean value of following characters: SVL (snout-vent length in mm); length of appendages (as % SVL); ratio width to height of second loreal; and number of midbody scale-rows, lamellae under fourth toe, supraciliaries, palpebrals, upper labials, ear lobules and nuchals. Data solely from material listed in accounts of species.

	N	SVL	Tail	Fore-leg	Hind-leg	Loreal	Scale rows	Lamel-lae	Supra-cilia-ries	Pal-pe-brals	Lab-ials	Ear lob-ules	Nuchals
<i>ocellifer</i>	62 (21)	72	154	25.0	37.8	1.02	34.6	23.3	6.9	11.2	8.0	4.6	3.0
<i>grandis</i>	63 (20)	76	174	24.0	37.1	1.04	32.3	22.2	7.6	11.0	8.0	5.7	2.9
<i>helenae</i>	72 (30)	80	187	21.6	35.7	1.39	28.8	21.2	7.0	10.6	8.1	4.5	2.7
<i>lesueurii</i>	21 (3)	76	233	23.2	40.0	1.31	29.1	21.2	7.3	10.8	8.0	5.2	2.7
<i>severus</i>	37 (14)	69	213	24.0	42.0	1.35	29.8	20.8	7.2	10.5	8.2	4.9	2.9
<i>leonhardii</i>	138 (74)	63	208	25.0	48.0	1.39	28.5	25.1	7.3	10.4	8.0	4.4	3.8
<i>uber</i>	14 (8)	60	222	26.3	50.4	1.36	30.8	25.8	7.0	11.3	8.1	4.2	3.6
<i>mimetes</i>	10 (5)	65	236	25.2	50.9	1.33	27.8	26.2	6.9	12.1	8.1	4.0	3.3
<i>dux</i>	54 (38)	42	198	29.3	49.5	1.48	30.0	26.7	6.8	11.0	8.1	4.4	3.0
<i>ariadnae</i>	7 (4)	49	174	25.4	41.1	1.40	31.1	22.6	6.6	9.8	8.0	5.4	2.6
<i>quattuordecimlineatus</i>	88 (33)	55	207	26.1	44.1	1.43	28.7	24.3	7.0	10.6	8.0	4.1	2.6
<i>atlas</i>	31 (10)	57	206	25.6	44.2	1.42	29.9	23.3	6.8	11.5	8.0	3.8	2.6
<i>impar</i>	22 (7)	55	188	25.2	41.7	1.23	27.7	21.8	6.9	10.2	7.0	3.7	3.0
<i>piankai</i>	11 (5)	38	219	29.4	45.7	1.23	24.9	22.4	6.5	9.9	8.0	3.5	3.1
<i>leae</i>	20 (12)	52	252	28.1	53.9	1.26	23.1	26.5	6.8	10.6	8.0	3.3	3.4
<i>calurus</i>	34 (21)	38	203	26.2	49.3	1.87	25.5	21.8	6.8	9.7	7.0	3.6	3.5
<i>nasutus</i>	6 (5)	38	217	26.4	45.4	1.75	24.0	24.2	6.0	9.7	7.7	2.1	3.7
<i>schomburgkii</i>	77 (45)	40	171	26.4	48.7	1.56	26.8	21.8	6.8	9.3	7.1	3.1	3.6
<i>brooksii</i>	56 (36)	38	184	27.1	50.4	1.85	25.4	24.1	6.7	9.6	7.4	3.3	2.3

Material in the Western Australian Museum is prefixed with R; in Dr Pianka's collection with ERP (usually his field-number is not cited but only number of specimens from a locality separated by a comma from the prefix); in the collections of the Joint British Services Expedition to Central Australia by JSE (kindly lent by Lt Cdr A. Y. Norris); and in the Museum of Comparative Zoology by MCZ (kindly lent by Dr. E. Williams). For the loan of the types of *leae* and *inornatus* I am indebted to Mr E. N. Arnold (British Museum); for *pantherinus* and *schomburgkii* to Dr G. Peters (Berlin Museum); *colletti*, Dr P. Pethon (Oslo Museum); *taeniatus*, Mr F. J. Mitchell (South Australian Museum); *schevilli*, Mr J. T. Woods (Queensland Museum); and *brooksi*, Dr E. Williams. I am grateful to Mrs Ariadna Neumann (Librarian, Western Australian Museum) for translating papers by Peters, Fischer and Sternfeld, and to Dr E. R. Pianka for guidance and criticism.

Genus *Ctenotus*

Ctenotus Storr, 1964, W. Aust. Nat. 9: 84.

Type-species *Lacerta taeniolata* Shaw.

Diagnosis. Active, diurnal, terrestrial, small to moderately large, slender to moderately stout, smooth-scaled skinks with well-developed pentadactyl limbs; long, slender, fragile tail; no supranasals; frontoparietals and interparietal free; lower eyelid movable, without a transparent disc; 2 loreals; 3 temporals, upper secondary much the largest, primary and lower secondary subequal and usually a little smaller than last two labials; ear aperture moderately large with sunken tympanum. Distinguishable from *Egernia* and *Omolepida* by contact of parietals behind interparietal, and from *Sphenomorphus* by presence of ear lobules and by colour pattern consisting mainly of longitudinal lines, stripes and rows of spots.

Distribution. Continental Australia and southern New Guinea.

Remarks. As an aid in diagnosis, I have tentatively placed the 19 species of the Eastern Division in 6 species-groups named after the earliest known species in each, viz. *pantherinus*, *grandis*, *lesueurii*, *taeniolatus*, *colletti* and *schomburgkii*. Whether these species-groups constitute natural assemblages will remain unknown until a greater part of the genus is studied and additional characters are considered. Meanwhile it seems best not to define them formally but to let students infer their superficial characters from the first five couplets in the following key.

Key

1. Dorsal and lateral pattern entirely ocellate; nasal strongly grooved; subdigital lamellae sharply keeled *pantherinus ocellifer*
- Dorsal pattern not ocellate; lateral pattern usually not ocellate (ocelli may be present on side of body and tail in *grandis*); nasal weakly or not grooved 2
2. Subdigital lamellae smooth, callose or obtusely keeled; snout short to moderately long, not low or narrow; body and appendages slender to stout; size small to very large 3
- Subdigital lamellae with a fine, sharp keel usually ending in a mucron or short spine; head low;

- snout long, low and narrow; body and appendages slender; size minute to small (SVL up to 62) 4
3. Dorsal pattern striped or plain; lateral pattern either plain, spotted or combining spots with stripes; subdigital lamellae smooth, callose or obtusely keeled; body and appendages slender to stout; size medium to very large; nasals usually separated (except in *leonhardii* and *grandis*) 5
- Dorsal and lateral pattern consisting entirely of alternating dark and pale stripes (except in *piankai*, whose dark upper lateral stripe may enclose a line of white dots); subdigital lamellae narrowly callose or obtusely keeled; body and appendages slender; size small (SVL up to 70); nasals usually in contact (except in *impar*)—*taeniolatus* group 12
4. Dorsal and lateral pattern consisting entirely of clearcut alternating dark and pale stripes; nasals usually in contact; size minute to small—*colletti* group 17
- Dorsal pattern striped, variegated or indistinct; lateral pattern spotted, blotched or vertically barred; nasals usually separated; size minute (SVL up to 50)—*schomburgkii* group 19
5. Back indistinctly or boldly striped; sides greyish with white centres of scales tending to form vertical bars; second loreal usually high and apically angular; nasals often in contact—*grandis* group 6
- Sides with or without stripes but pattern clearcut (except in *helenae*) with pale markings (when present) longitudinally aligned; second loreal usually oblong and lower than wide; nasals seldom in contact (except in *leonhardii*)—*lesueurii* group 7
6. Back reddish, striped with dark brown (vertebral stripe well developed; others may be discontinuous or barely discernible); tail short and thick, basally constricted and with buffy dark-edged vertical bars on side *grandis* (adult)
- Back with alternating black and pale green stripes; tail slender *grandis* (juv)
7. Back dark greenish brown, with or without black vertebral stripe but seldom with black laterodorsal stripe; lateral pattern obscure, with little or no indication of pale dorsolateral and midlateral stripes; sides of body and tail (and often under tail) dotted with black *helenae*
- Back usually reddish brown (never greenish); white dorsolateral line conspicuous and margined above by blackish laterodorsal stripe; dark upper lateral stripe enclosing one or two series of pale dots, spots or blotches 8
8. Back reddish brown, entirely without pattern between narrow black laterodorsal stripes; conspicuous white midlateral stripe from lores to groin, not much wider than white dorsolateral line; dark upper lateral stripe almost completely broken by pale squarish blotches *mimetes*
- Some indication of dark vertebral stripe (if only a median line on neck); blackish laterodorsal stripe much wider than white dorsolateral line (except occasionally in *severus* and *uber*); white midlateral stripe either absent, poorly developed (e.g. not extending forward to level of foreleg) or well developed (in which case it is much wider than dorsolateral

- line); dark upper lateral stripe enclosing pale dots or small spots (large only in *lesueurii*) 9
9. Dark vertebral stripe well developed and narrowly edged with white or pale brown; dark upper lateral stripe in contact with white dorsolateral line 10
Dark vertebral stripe reduced to a line, i.e. sutures between paravertebral scales (occasionally wider in *severus*) 11
10. Dark upper lateral stripe with one or 2 series of pale dots; toes moderately compressed, with more than 20 lamellae under fourth, each with a narrow brown callus or obtuse keel; nasals usually in contact; prefrontals usually separated; nuchals usually more than 3; SVL up to 78 *leonhardii*
Dark upper lateral stripe with a series of pale spots or blotches; toes not compressed, with fewer than 24 lamellae under fourth, mostly with a low, very wide callus (higher proximally); nasals usually separated; prefrontals usually in contact; nuchals rarely more than 3; SVL up to 97 *lesueurii*
11. Dark laterodorsal stripe usually enclosing a series of pale spots; dark upper lateral stripe in contact with white dorsolateral line; little or no indication of white midlateral stripe; toes moderately compressed, with more than 20 lamellae under fourth, each with a narrow brown callus or obtuse keel; SVL up to 70 *uber*
Dark laterodorsal stripe not enclosing a series of pale spots; dark upper lateral stripe narrowly separated from white dorsolateral line; white midlateral stripe discernible; toes not compressed, with fewer than 24 lamellae under fourth, mostly with a wide flat callus (higher proximally); SVL up to 91 *severus*
12. Vertebral stripe white (sometimes split anteriorly by black line); upper labials usually 7; nasals and prefrontals separated *impar*
Vertebral stripe black or brown; labials usually 8; nasals and prefrontals usually in contact except in southernmost *atlas*) 13
13. Back and sides brown with a total of 6 white stripes (a paravertebral, dorsolateral and midlateral on each side); midbody scale-rows 26 or fewer *piankai*
Back and sides black or dark brown with a total of 8-22 white or brown stripes; midbody scale-rows 26 or more 14
14. White midlateral stripe (and ventrolateral stripe when present) not extending forward to level of foreleg; lateral pattern between arm and ear absent or indistinct; dark innermost dorsal stripe diverging on nape from vertebral stripe *ariadnae*
White midlateral stripe (and ventrolateral stripe when present) extending forward nearly to ear 15
15. Head dark olive grey, variegated with black; more than 17 pale stripes including 7 on each side, which (apart from midlateral and ventrolateral) are slightly undulate and very fine; abdomen bluish white (in alcohol) *dux*
Head brown, not variegated with black; fewer than 17 whitish stripes (none undulate or very fine); abdomen white 16
16. Whitish stripes totalling 14 (rarely 16) including 2 on each side between midlateral and dorsolateral stripes *quattuordecimlineatus*
Whitish stripes totalling 8 (occasionally 10) with only one on each side between midlateral and dorsolateral stripes *atlas*
17. Ear lobules 2 (occasionally 3), upper semicircular and very much larger than other; first supraocular larger than second; snout extremely long and narrow, concave in plan; blackish midfrontal streak narrow and conspicuous; tail yellowish brown above, entirely white below *colletti nasutus*
Ear lobules 2-5, graded in size; first supraocular usually smaller than second; blackish midfrontal streak absent or inconspicuous 18
18. Tail blue above, transversely marked below with black (especially proximally and ventrolaterally); series of plantars opposite fourth toe enlarged and keeled; upper labials 7 *calurus*
Tail red above, pinkish below; no enlarged, keeled plantars; upper labials 8 *leae*
19. Back olive brown to greenish white, with black stripes variously developed but always including vertebral; white dorsolateral and midlateral stripes well developed; dark upper and lower lateral stripes enclosing large pale spots or broken by reddish vertical bars; prefrontals usually separated *schomburgkii*
Back lustrous red (fading in alcohol to pale opalescent green or brown); black vertebral stripe and dorsal spots in juveniles, but little or no dorsal pattern in adults; white dorsolateral and midlateral stripes indistinct or absent; dark upper lateral stripe represented by series of small, squarish blotches; prefrontals usually in contact *brooksi*

Ctenotus pantherinus ocellifer

Lygosoma ocellatum Boulenger, 1896, Ann. Mag. Nat. Hist. (6) 18:223. Broome, Western Australia (K. Dahl).

Lygosoma ocelliferum [Boulenger], 1896, Ann. Mag. Nat. Hist. (6) 18:342. New name for *Lygosoma ocellatum* Boulenger, not *Lygosoma ocellatum* (Gray.)

Egernia whitei carnarae Kinghorn, 1931, Rec. Aust. Mus. 18:88. Carnarvon, Western Australia (D. G. Stead).

Lygosoma (Hinulia) breviunguis Kinghorn, 1932, Rec. Aust. Mus. 18:200. Same holotype as *E. w. carnarae*.

Diagnosis. A large, stout *Ctenotus* with short, thick tail; dorsal and lateral pattern consisting solely of ocelli; nasal grooved; subdigital lamellae sharply keeled. Distinguishable from *C. p. pantherinus* by absence of dark vertebral stripe.

Distribution. South to Atley, Goongarrie, Queen Victoria Spring and Neale Junction. Extralimital in Kimberley and North-West Divisions and Northern Territory.

Description. SVL (mm) : 32-96; males with everted hemipenes 71-83; gravid females 90-96. Length of appendages (% SVL) : tail 133-189, foreleg 21-35, hindleg 31-47.

Nasals in contact; groove from bottom of nasal up to behind nostril, whence it may continue obliquely along bottom of wide, shallow indentation in upper posterior sector of scale. Prefrontals in contact (occasionally very narrowly separated). Supraoculars 4, first 3 in

contact with frontal. Supraciliaries usually 7, occasionally 6, rarely 8. Palpebrals 9-14, first 4 keeled. Second loreal 0.7-1.4 times as wide as high. Upper labials 8 (rarely 7 or 9). Ear lobules 3-7, more acute in adults than juveniles. Nuchals 2-4. Midbody scale-rows 31-38 (usually 34 or 36). Lamellae under fourth toe 21-27, each with a fine dark keel.

Head, neck and tail olive grey or brown. Back olive in juveniles, dark brown or coppery in adults. Side of body often suffused with pink, especially inferiorly. Back and sides of body and tail with scattered ocelli, each occupying whole of a scale and consisting of central white spot or short longitudinal bar margined on each side with short black longitudinal bar. Ocelli mainly located on alternate longitudinal scale-rows and separated from each other by 2 or 3 transverse scale-rows. Dorsal ocelli beginning about level of foreleg and extending back to base of tail. Lateral ocelli extending forward nearly to ear and back nearly to middle of tail (on which white bars may coalesce to form midlateral stripe). Under surface greyish white, scales narrowly edged with pale grey.

Remarks. The holotype of *Lygosoma (Hinulia) pantherinum* Peters belongs to the small, relatively slender, rock-inhabiting southwestern race.

Material. Well 43, Canning Stock Route (R 8717); Well 35 (R 3948); 26 mi. SSE of Kidson Camp (R 26999); 59 mi. E of Well 24 (R 27008); 35 mi. W of Well 23 (R 27068); 63 mi. E of Talawana (R 27100); Pierre Spring (R 27844); Well 6 (R 27242-3); 11 mi. N of Charles Knob (R 26910); Mu Hills (ERP, 1); 12 mi. E of Barrow Range (ERP, 3); 4 mi. W of Warburton Range (R 15704); Nullye (R 25943); 64 mi. E of Cosmo Newbery (R 28879); Yamarna (R 28782); 21 mi. W of Lorna Glen (ERP, 2); 9 mi. NNE of Millrose (ERP, 7); Lake Violet (R 2765); 17 mi. S of Atley (ERP, 3); 24 mi. ENE of Laverton (ERP, 6); 5 mi. NE of Dunges Table (ERP, 9); 65 mi. W of Neale Junction (ERP, 1); 31 mi. W of Neale Junction (R 27263); 8 mi. W of Neale Junction (ERP, 1); 18 mi. S of Neale Junction (ERP, 14); 8 mi. S of Goongarrie (R 26375); Queen Victoria Spring (R 17308).

Ctenotus grandis sp. nov.

Holotype. R 30005 in Western Australian Museum, formerly ERP 10904, an adult collected by Eric and Helen Pianka on 1 March 1967 at 24 miles ENE of Laverton, Western Australia, in 28° 31'S, 122° 45'E.

Diagnosis. A very large *Ctenotus* with relatively stout body and short, thick appendages; 5 dark dorsal stripes on a greenish ground (juveniles) or reddish ground (adults); sides dark with small white spots tending to be arranged in vertical bars; second loreal usually high, pentagonal, with angular apex.

Distribution. South to Atley, Agnew, Laverton and Neale Junction. Extralimital in North-West Division (north) and Northern Territory (centre and south).

Description. SVL (mm): 39-106; males with everted hemipenes 89-99. Length of appendages

(% SVL): tail 149-189; foreleg 20-28; hindleg 31-43.

Nasals separated or in contact. Prefrontals in contact (occasionally narrowly separated). Supraoculars 4, first 3 in contact with frontal. Supraciliaries 6-10 (usually 7 or 8). Palpebrals 9-14 (mostly 10 or 11). Second loreal 0.7-1.6 times as wide as high. Upper labials 8 (rarely 7 or 9). Ear lobules 4-8; usually obtuse in juveniles and acute in adults, third mostly largest. Nuchals 1-5. Midbody scale-rows 30-34. Lamellae under fourth toe 19-26, each with a dark-brown obtuse keel or narrow callus in juveniles, and a wide, flat, pale callus in adults.

Juvenile coloration. Back, side of body and base of tail black, becoming greyish brown on head and remainder of tail. Six greenish-white stripes through centre of dorsal scales, as wide as interspaces. White centres of lateral scales vaguely arranged in vertical bars, inferiorly deflected forwards.

Adult coloration. Back dark brownish red (fading to pale brown in alcohol); head and neck olive brown; tail greyish brown. Blackish-brown vertebral stripe from nape to proximal quarter of tail. On each side two dark-brown dorsal stripes, less prominent and narrower than vertebral stripe, sometimes broken and barely discernible. Side of body dark greyish-brown flecked with white; midlaterally and ventrolaterally white marks tend to cluster and to be arranged in vertical series. Side of tail with irregular white or buff vertical bars edged with dark brown. Upper surface of limbs reddish brown, variegated on hindleg (but not foreleg) with dark and pale brown. Lips pale, sutures margined with brown. Under surface whitish.

Remarks. This species is especially notable for the great difference between juveniles and adults in dorsal coloration. In this respect juveniles resemble members of the *taeniolatus* group, while adults are remarkably similar to *Egernia striata*. The change from greenish to reddish dorsum occurs between SVL 50 and 70.

Material. Well 26, Canning Stock Route (R 3901); 10 mi. NW of Mt Beadell (R 28813); 6 mi. SW of Manunda (R 25941); 18 mi. S of Neale Junction (ERP, 2); 8 mi. W of Neale Junction (ERP, 5); 70 mi. W of Neale Junction (ERP, 2); 27 mi. ENE of Laverton (R 28830-1); 24 mi. ENE of Laverton (ERP, 44); 10 mi. NW of Agnew (ERP, 1); 17 mi. S of Atley (ERP, 3).

Ctenotus helenae sp. nov.

Holotype. R 30004 in Western Australian Museum, formerly ERP 10703, an adult collected by Eric and Helen Pianka on 23 February, 1967, at 24 miles ENE of Laverton, Western Australia, in 28° 31'S, 122° 45'E.

Diagnosis. A large member of the *lesueurii* group with moderately thick body and appendages; back dark greenish-brown; little indication of pattern except for dark vertebral stripe (which may be absent in northern specimens) and mottled flanks.

Distribution. Sandy deserts south to Laverton and Neale Junction and west to the Robertson Range, Millrose and Agnew. Extralimital in Northern Territory (western interior).

Description. SVL (mm): 34-95; males with everted hemipenes 75-86. Relative length of

appendages (% SVL): 148-226; foreleg 19-28; hindleg 32-47.

Nasals separated (just touching in one specimen). Prefrontals usually in contact. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 6-8 (mostly 7). Palpebrals 9-14 (mostly 10 or 11). Second loreal 1.0-1.9 times as wide as high. Upper labials 8 (occasionally 9). Ear lobules 4-6 (rarely 2 or 3), obtuse in juveniles, acute in adults, second or third usually largest. Nuchals 2 or 3 (4 in one specimen). Midbody scale-rows 26-33 (mostly 28 or 30). Lamellae under fourth toe 18-24, slightly compressed and narrowly callose in juveniles, uncompressed and broadly callose or smooth in adults.

Dorsal ground colour dark brown, suffused on back and base of tail with green. Black vertebral stripe usually present from nape to base of tail, seldom edged with brown paler than ground colour. Sides of body and tail greyish, flecked or dotted with black (and occasionally whitish). Occasionally an indistinct pale dorsolateral line and midlateral stripe, each narrowly edged with black. Under surface whitish, becoming bluish grey on abdomen and often suffused with grey and dotted with black under tail.

Remarks. Named after Helen Louise Pianka, who accompanied her husband on all his desert trips and assisted substantially in collecting the material that made this revision possible. *C. helenae* is closely related to *lesueurii*, which it replaces in arid, spinifex-dominated country.

Material. Swindells Field (R 29883); Robertson Range (R 25186); 9 mi. NNE of Millrose (ERP, 2); 21 mi. W of Lorna Glen (ERP, 1); 9 mi. SW of Gahnda (R 25942); 10 mi NW of Agnew (ERP, 2); 24 mi. ENE of Laverton (ERP, 53); 5 mi. NE of Dunes Table (ERP, 1); 8 mi. W of Neale Junction (ERP, 1); 18 mi. S of Neale Junction (ERP, 6).

Ctenotus Lesueurii

Tiliqua australis Gray, 1839, Ann. Nat. Hist. 2: 291. Australia. [= *Lygosoma australe* (Gray) of Peters, not *Lygosoma australis* Gray.]

Lygosoma lesueurii Duméril & Bibron, 1839 Erpétologie générale 5: 733. Australia (Péron & Lesueur).

Diagnosis. A large, slender member of the *lesueurii* group with relatively short, stout and uncompressed toes; subdigital lamellae bearing very broad, pale calli, mostly flat but proximally subtubercular; black, white-edged vertebral stripe and white, black-edged dorsolateral line always present; nasals usually separated; prefrontals usually forming long median suture; seldom more than 3 nuchals.

Distribution. Rocky hills in the Savory Creek drainage. Extralimital in much of tropical and subtropical Australia, excluding the more arid regions.

Description (including some extralimital material). SVL (mm): 39-97. Length of appendages (% SVL): tail 214-244; foreleg 20-30; hindleg 34-47.

Nasals separated (occasionally in contact). Prefrontals in contact (occasionally narrowly separated). Supraoculars 4, first 3 in contact with frontal. Supraciliaries 7 or 8. Palpebrals 9-12. Labials 8 (rarely 9). Ear lobules 4-7, obtuse in juveniles, usually long and acute in adults but occasionally truncate. Nuchals 2 or 3 (rarely 4). Midbody scale-rows 28 or 30 (rarely 26 or 32). Subdigital lamellae 19-23.

Dorsal ground colour variable; usually brown, more olive on head, more reddish on tail and limbs. Black vertebral stripe from nape to tail (on which it is paler), edged with white (occasionally very pale brown). White dorso-lateral line from nape to tail (on which it is suffused with brown), occasionally extending indistinctly forward to supraciliaries, margined above and below with black. Upper lateral stripe blackish brown or grey with a series of large whitish spots or blotches partly suffused with grey or brown. Broad whitish midlateral stripe from behind axilla to tail, hardly interrupted by thigh, narrowly margined above and below with black. Limbs longitudinally streaked with dark brown. Under surface whitish.

Remarks. This skink barely penetrates the Eastern Division, and its description has been augmented with material from neighbouring parts of the North-West Division, i.e., the rocky country round the sources of the De Grey and the Fortescue.

This population could prove as worthy of recognition as is *severus*. However, it is best referred to binomially pending revision of all populations of "*lesueurii*".

Material. Robertson Range (R 25184-5); Well 24, Canning Stock Route (R 27050). [North-West Division: Mt Edgar (R 17133-4, 17156-62, 17164-5); Meentheena (R 13209); Ripon Hills (R 13244); Ragged Hills (R 13208); Mt Newman (R 25177-8, 25194, 26531).]

***Ctenotus severus* sp. nov.**

Holotype. R 25680 in Western Australian Museum, an adult collected by G. M. Storr on 27 August 1965 at Galena, Western Australia, in 27° 49' S, 114° 41' E.

Diagnosis. A moderately large member of the *lesueurii* group, closely related to *C. lesueurii* but differing in poor development of dark vertebral stripe; absence of whitish paravertebral line; dark upper lateral stripe enclosing smaller pale spots and separated by narrow interspace from white dorsolateral line.

Distribution. Southern part of Division immediately north of "Mulga-Eucalypt Line", east to Leonora-Kookynie district. Extralimital in North-West Division (southern interior) and South-West Division (northern interior).

Description (including extralimital material). SVL (mm): 44-91. Length of appendages (% SVL): tail 183-228, foreleg 19-27, hindleg 36-47.

Nasals usually separated. Prefrontals usually in contact. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 6-8 (mostly 7, rarely 6). Palpebrals 9-13 (mostly 10 or 11). Second loreal 1.0-1.8 times as wide as high. Upper labials 8 (occasionally 9). Ear lobules 3-7; obtuse in juveniles; acute, subacute or truncate in adults; second or third usually largest. Nuchals 2-4 (mostly 3). Midbody scale-rows 28-32 (usually 30). Lamellae under fourth toe 18-23, each uncompressed and bearing a broad, flat, pale brown callus (paler and higher on proximal lamellae).

Dorsal ground colour varying from bright, slightly rufous brown in east to dark grey or olive-brown in west. Vertebral stripe variously

developed but never pale-edged; usually reduced to a black or dark-brown line on neck, occasionally continuing back to base of tail, rarely broad enough to call a stripe. Blackish laterodorsal stripe from occiput or neck to proximal quarter of tail, usually much wider than adjacent dorsolateral line. Conspicuous white dorsolateral line from supraciliaries to base of tail, anteriorly and posteriorly suffused with brown, separated from dark upper lateral stripe by narrow interspace of pale grey or brown. Upper lateral stripe dark brown with pale dots or small spots of varying shape and arrangement. Pale midlateral stripe usually narrow and indistinct, extending back to groin and sometimes forward to ear. Ventrolateral streak obscure; represented on lips by brownish-grey variegations. Limbs longitudinally streaked with dark brown. Under surface whitish.

Remarks. While this taxon may prove to be a subspecies of *C. lesueurii*, its name is not *inornatus* as believed by Glauert and apparently also by Loveridge. *Hinulia inornata* Gray is a very different member of the *lesueurii* group, which Glauert redescribed as *concolor*.

Material. 7 mi. E of Leonora (R 20617); Niagara (R 15726-7); Jeedamya (R 24042); Pigeon Rocks (R 12533). [North-West Division: Landor (R 2707); 16 mi. NW of Mileura (R 20345); Mileura (R 15773, 15803, 15807, 28340); Belele (R 7370); Meka (R 29270); 24 mi. S of Cue (R 17191-2); Yalgoo (R 4948); 22 mi. SW of Yalgoo (R 17197-8); Burnerbinmah (R 13970, 13973); 18 mi. N of Paynes Find (R 18549); Fields Find (R 25637); Warriedar (R 29753); Pindabunna (R 12531-2, 17193). South-West Division: Galena (R 17195-6, 19994-6, 25680-3).]

Ctenotus leonhardii

(?) *Lygosoma* (*Hinulia*) *taeniolatum* White, var. *maculata* Rosén, 1905, Ann. Mag. Nat. Hist. (7) 16:140. "West Australia" (N. Holst). [Not *Lygosoma maculatum* (Blyth).]

Lygosoma (*Hinulia*) *leonhardii* Sternfeld, 1919, Senckenbergiana 1:79. Hermannsburg, Northern Territory (M. von Leonhardi).

Diagnosis. A moderately small member of the *lesueurii* group with subdigital lamellae slightly compressed and narrowly callose; dark brown, pale-edged vertebral stripe and pale midlateral stripe always present; dark laterodorsal stripe varying in width but never enclosing pale spots; nasals usually in contact; prefrontals usually separated.

Distribution. South to Atley, Laverton, Lake Yeo, Muggun and Warburton Range. Extralimital in North-West Division (north and northeast) and Northern Territory (central and south).

Description. SVL (mm): 33-78. Length of appendages (% SVL): tail 177-241, foreleg 21-30, hindleg 40-55.

Nasals usually in contact (occasionally narrowly separated, never widely). Prefrontals usually widely separated (occasionally narrowly separated or forming very short median suture). Supraoculars 4, first 3 in contact with frontal.

Supraciliaries 6-9 (mostly 7). Palpebrals 8-13. Second loreal 1.0-2.2 times as wide as high. Upper labials 8 (rarely 9, very rarely 7). Ear lobules 3-6, usually obtuse in juveniles and subacute in adults. Nuchals 2-6 (mostly 4). Midbody scale-rows 26-31 (mostly 28). Lamellae under fourth toe 21-30, each with a brown callus.

Head and ground colour of back and sides brown; tail and upper surface of limbs paler and slightly reddish brown. Dark brown vertebral stripe from nape to base of tail, narrowly edged with pale brown. Whitish dorsolateral line from upper postocular to about middle of tail, broadly margined above with dark brown. Broad upper lateral stripe with one or two series of whitish dots. Indistinct whitish midlateral stripe from behind axilla to hindleg. Under surface whitish.

Geographic variation. The above colour description is based on the Warburton Range series and is fairly typical of specimens from the far east of the Division (and from the North-West Division and Northern Territory). In the western half of the Division, east to Mungilli and Muggun, specimens are much darker, the extreme condition being found at Atley. Here the back and sides are dark chocolate-brown, broken only by the brownish-white paravertebral line, the white dorsolateral line, one or two series of upper lateral dots and the white midlateral stripe. Because the dark laterodorsal stripe has, in effect, spread right across to the paravertebral line, the dorsal pattern at Atley is more like that of *C. piankai* than typical *leonhardii*. To the north and east of Atley, coloration is generally similar except that anteriorly the laterodorsal stripe has begun to withdraw from the paravertebral line, leaving a hiatus of pale ground colour.

Material. Weld Spring (R 27862); near Millrose (ERP, 9); Fame Range (R 21054); 3 and 11 mi. E of Mungilli Claypan (R 26896, 26898); Browne Range (R 21042); 5 mi. NW of Mt Aloysius (R 20748); Mt Eveline (R 25913); 20 mi. E of Warburton Mission (R 15705); Warburton Mission (R 14644-7, 15155, 17270-8, 17741-4, 17840-8, 22011, 22065-6, 22112, 22119-20, 22187, 22206-7, 24836); Muggun (R 15772); 30 mi. E of Stony Point (ERP, 1); 3 mi. E of Stony Point (ERP, 11); Yamarna (R 28760, 28793); 18 mi. E of Laverton (ERP, 1); Laverton (R 1234); Wanjarri (R 19767, 27225-6); Albion Downs (R 28288); 17 mi. S of Atley (ERP, 55).

Ctenotus uber sp. nov.

Holotype. R 17654 in Western Australian Museum, an adult collected by P. J. Fuller on 1 December 1962 at 22 mi. SE of Yalgoo, Western Australia, in 28°34'S, 116°52'E.

Diagnosis. A moderately small member of the *lesueurii* group with vertebral stripe reduced to a dark line; dark laterodorsal stripe enclosing a series of pale spots (as in *Egernia whitei*); and little or no trace of pale midlateral stripe. Most like *leonhardii*, from which it is further distinguishable by more numerous midbody scale-rows, separated nasals, larger prefrontals and

almost complete absence of pattern on dorsal and dorsolateral surfaces of tail.

Distribution. Patchily distributed north to Mungilli Claypan and the Rawlinson Range. Extralimital in North-West and Eucla Divisions.

Description (including extralimital material). SVL (mm) : 37-70. Length of appendages (% SVL) : tail 215-238, foreleg 22-30, hindleg 44-58.

Nasals separated. Prefrontals separated or in contact. Supraoculars 4 (rarely 3), first 3 (rarely 2) in contact with frontal. Supraciliaries 5-9 (mostly 7). Palpebrals 10-14. Second loreal 1.0-1.9 times as wide as high. Upper labials 8 (occasionally 9). Ear lobules 3-5, small and obtuse in juveniles, acute or subacute in adults. Nuchals 2-5. Midbody scale-rows 30 or 32. Lamellae under fourth toe 21-31, slightly to moderately compressed, each with a brown callus or obtuse keel.

Dorsal ground colour golden brown; darker and more olive on head; more reddish on tail and limbs. Vertebral stripe blackish brown, very narrow, not pale-edged, beginning on nape and usually extending to base of tail (occasionally disappearing a little past middle of back). Blackish-brown laterodorsal stripe from last supraocular to about level of vent, enclosing a series of pale brown spots. Whitish dorsolateral line from supraciliaries to about level of vent. Broad dark-brown upper lateral stripe from temples to base of tail, enclosing about 3 series of brownish-white dots; represented anteriorly by narrow brown loreal streak, and posteriorly by brown stripe to at least middle of tail. Pale midlateral stripe absent or barely discernible. Lower half of flanks pinkish brown dotted with white. Upper surface of limbs longitudinally streaked with brown, darker and more distinctly on hindleg. Under surface whitish.

Geographic variation. In keeping with its spotty distribution, *uber* undergoes considerable geographic variation. The material falls into three groups: (1) southern (from Yalgoo east to the Nullarbor Plain); (2) northwestern (from Jiggalong southeast to Mungilli Claypan); (3) northeastern (Rawlinson Range).

In the south the limbs are shorter; midbody scale-rows fewer (mostly 30, against, mostly 32 in northwest); toes more compressed and bearing fewer subdigital lamellae (26 or less under fourth toe, against 26 or more in the northwest) with darker and narrower calli; nasals more widely separated; prefrontals in contact or narrowly separated (well separated in northwest); nuchals more numerous (3-5, against 2-3); second loreal narrower (1.0-1.4 times as wide as high, against 1.5-1.9 in northwest).

The single specimen from the Rawlinson Range is the most peculiar in coloration. Its dark laterodorsal stripe is too narrow to enclose a series of pale spots, and it alone has indication of a pale midlateral stripe. In most other respects it agrees with the northwestern series, but its limbs are as short and its second loreal as narrow as in southern specimens.

Remark. Two of the syntypes of *Lygosoma schomburgkii* Peters resemble southern specimens of *uber* except for their well-developed pale-edged vertebral strip extending back towards end of tail. [The other syntypes, as dis-

cussed later under *C. schomburgkii*, are conspecific with *Lygosoma fischeri* Boulenger.]

Material. Mungilli Claypan (R 26894-5); 11 mi. E of Mungilli Claypan (R 26897); Pass of the Abencerrages, Rawlinson Range (R 20579); Woolgangie (R 12748); 30 mi. E of Kalgoorlie (R 7069); 15 mi. SSE of Karonie (R 17335). [North-West Division : Jiggalong (R 13341, 25118); Gnows Nest (R 17654, 26349). Eucla Division : Seemore Downs (R 17284-5); Forrest (R 17268).]

Ctenotus mimetes sp. nov.

Holotype. R 17991 in Western Australian Museum, a subadult collected by D. A. Richards on 22 October 1961 at 12 mi. E of Paynes Find, Western Australia, in 29°13'S, 117°53'E.

Diagnosis. A moderately small member of the *lesueurii* group with back brown and unpatterned except for black laterodorsal stripe, which is unspotted and not much wider than adjacent white dorsolateral line; conspicuous narrow white midlateral stripe separating dark upper and lower lateral zones, each of which encloses a series of large pale spots. Further distinguishable from *severus* by more slender and compressed toes, with lamellae more numerous and narrowly callose.

Distribution. Far western semiarid zone north to lat. 29°S. Extralimital in North-West Division and South-West Division (north and east).

Description (including extralimital material). SVL (mm): 33-79. Length of appendages (% SVL): tail 193-280, foreleg 22-30, hindleg 45-56.

Nasals widely separated. Prefrontals in contact (occasionally narrowly separated). Supraoculars 4, first 3 in contact with frontal. Supraciliaries 5-8 (mostly 7). Palpebrals 10-14. Second loreal 1.0-1.9 times as wide as high. Upper labials 8 (occasionally 9). Ear lobules 4 (occasionally 3 or 5), obtuse in juveniles, subacute in adults, second usually largest. Nuchals 3 or 4. Midbody scale-rows 26 or 28 (32 in one specimen). Lamellae under fourth toe 23-28, each compressed and bearing a narrow dark-brown callus or obtuse keel.

Dorsal ground colour brown, duller anteriorly, brighter and redder posteriorly (including upper surface of hindleg). Dorsal pattern restricted to narrow black laterodorsal stripe from central supraciliaries to base of tail, whence it may extend (as a series of small dark-brown spots) to proximal third of tail. White dorsolateral line from supraoculars to middle of tail (on which it is suffused with pink), in contact with black laterodorsal and upper lateral stripes. Broad black upper lateral stripe from orbit to base of tail, enclosing large pale spots of varying shape and colour (usually whitish, largely suffused with reddish brown, and occupying more space than black background and tending to be oblong and vertically elongate). White midlateral stripe, no wider than white dorsolateral line, extending from lores to groin, whence (becoming wider and reddish) it runs along inner surface of thigh; represented on tail by moderately wide ventrolateral stripe. Lower lateral pattern similar to upper lateral but narrower and less regular. Limbs reticulated

with blackish brown. Sutures between labials narrowly margined with brown. Under surface white.

Remarks. The resemblance in dorsal pattern between this species and *C. labillardieri* has led to erroneous northern and inland records of the latter species. More remarkable is the resemblance in lateral pattern between *mimetes* and *schomburgkii*.

Material. 42 mi. S of Youanmi (R 19119). [North-West Division: Duck Creek, Wyloo (R 13211); 12 mi. E of Paynes Find (R 17991); 44 mi. NE of Paynes Find (ERP, 1). South-West Division: 20 mi. NE of Yuna (R 26499); Yuna (R 8303, 9021); Carnamah (R 407); Merredin (R 1265-6).]

***Ctenotus dux* sp. nov.**

Holotype. R 30002 in Western Australian Museum, formerly ERP 11269, an adult collected by Eric and Helen Pianka on 6 May 1967 at 5 miles NE of Dunes Table, Western Australia, in 28°08'S, 123°55'E.

Diagnosis. A moderately large member of the *taeniolatus* group with a total of about 20 white and brown dorsal and lateral stripes on a black ground (with growth, brown dorsal stripes spread laterally at expense of black ground so that dorsum of adults is better described as brown, striped with black). Further distinguishable from *ariadnae* by clearer-cut lateral pattern, especially anteriorly (where white midlateral and ventrolateral stripes extend forward nearly to ear), and from *quattuordecimlineatus* by narrower and more numerous white lateral lines (including one between midlateral and ventrolateral white stripes).

Distribution. Sandy deserts from the Mu Hills south and west to Dunes Table and Lorna Glen. Extralimital in Northern Territory (south).

Description. SVL (mm): 32-64. Length of appendages (% SVL): tail 176-226, foreleg 25-32, hindleg 42-54.

Nasals usually in contact. Prefrontals in contact. Supraciliaries 4, first 3 in contact with frontal. Supraciliaries usually 7, occasionally 6, rarely 8. Palpebrals 9-13. Second loreal 1.0-1.9 times as wide as high. Upper labials 8 (occasionally 9). Ear lobules 2-6, usually obtuse in juveniles and acute in adults. Nuchals 2-4 (mostly 3). Midbody scale-rows 28-32. Lamellae under fourth toe 23-30, each with a dark brown callus or obtuse keel.

Dorsal ground colour brown (tinged with reddish or metallic olive) becoming darker and more olive on head, and paler and more buffy on tail and upper surface of limbs. Prominent black vertebral stripe from nape (where it is narrow) to base of tail, narrowly edged with pale brown or brownish white. Black laterodorsal stripe from last supraocular to proximal third of tail, almost as wide as vertebral stripe, narrowly and more or less obscurely margined above with pale brown. Dorsal zone between these black stripes (and their pale margins) varicosely marked with black. Immediately below laterodorsal stripe, a narrow but prominent white dorsolateral stripe from upper postocular to distal quarter of tail. Sides black with 7 white lines or stripes, the widest of which are the lowest (ventrolateral) and third-lowest

(midlateral); remainder wavy and very narrow. Midlateral white stripe extending from below and in front of eye to middle of tail, interrupted by ear aperture and almost completely by thigh. Ventrolateral white stripe from below and behind ear to groin, interrupted by arm. Head variegated with blackish. Sutures between labials margined with black or blackish brown. Limbs streaked with dark brown. Under surface bluish white (in alcohol), darkest on abdomen.

Material. Mu Hills (ERP, 1); 56 mi. SW of Warburton Range (ERP, 1); Muggun (R 15721); Nullye (R 20705); Lake Throssell (ERP, 1); Yamarna (R 28785-8); 5 mi. NE of Dunes Table (ERP, 36); 21 mi. W of Lorna Glen (ERP, 8).

***Ctenotus ariadnae* sp. nov.**

Holotype. R 30006 in Western Australian Museum, formerly ERP 10667, an adult collected by Eric and Helen Pianka on 22 February 1967 at 24 miles ENE of Laverton, Western Australia, in 28°31'S, 122°45'E.

Diagnosis. A moderately large member of the *taeniolatus* group closely related to *dux* and *quattuordecimlineatus* but distinguishable from both by its shorter appendages, paler coloration and almost complete lack of lateral pattern between ear and foreleg (especially failure of white midlateral and ventrolateral stripes to extend anteriorly beyond arm).

Distribution. From Well 30 (Canning Stock Route) south nearly to Laverton.

Description. SVL (mm) : 29-64. Length of appendages (%SVL) : tail 162-186, foreleg 21-30, hindleg 34-47.

Nasals in contact. Prefrontals in contact. Supraciliaries 4, first 3 in contact with frontal. Supraciliaries 6 or 7. Palpebrals 9-12. Second loreal 1.0-2.0 times as wide as high. Upper labials 8. Ear lobules 4-7, obtuse in juveniles, long and acute in adults. Nuchals 1-4. Midbody scale-rows 29-34. Lamellae under fourth toe 20-24, each with a narrow brown callus or obtuse keel.

Head olive grey or brown. Tail and limbs pale reddish brown. Back and sides dark brown (adults) or blackish (juveniles) with about 18 pale lines or stripes well-defined dorsally but increasingly ill-defined on sides. Pale brown paravertebral line from nape to middle of tail. Pale brown dorsal line from nape to base of tail. Whitish dorsolateral line from above temples or ear to distal part of tail (on which it is wider and suffused with brown). 3 or 4 pale-brown upper lateral lines, upper extending anteriorly almost to level of ear, lower not reaching forward to or past level of arm. White midlateral stripe more or less narrow and indistinct, not reaching forward to axilla. Pale ventrolateral stripe indistinct or absent, not reaching forward to axilla. Underneath whitish except for greyish lateral margins of ventrals (and sometimes also of gulars).

Remarks. Named after Mrs Ariadna Neumann (Librarian, Western Australian Museum) in appreciation of the many translations she has done for me.

Material. Well 30, Canning Stock Route (R 3917); 60 mi. E of Dunes Table (ERP 10429); White Cliffs (R 20660); 24 mi. ENE of Laverton (ERP 10765, 10796, 10802).

Ctenotus quattuordecimlineatus

Lygosoma (Hinulia) quattuordecimlineatum Sternfeld, 1919, *Senckenbergiana* 1:80. Hermannsburg, Northern Territory (M. von Leonhardi).

Diagnosis. A moderately large member of the *taeniolatus* group with a total of 14 or 16 whitish dorsal and lateral stripes on a blackish ground. Distinguishable from *atlas* by having at least 2 white lines (against one) between white dorso-lateral and midlateral stripes; from *ariadnae* by midlateral and ventrolateral white stripes extending forward beyond arm; and from *dux* by midlateral and ventrolateral white stripes wider than black interspace (which does not bear a white line).

Distribution. Sandy deserts north to about latitude 21°S, west nearly to Laverton and south to Queen Victoria Spring. Extralimital in Northern Territory (south).

Description. SVL (mm) : 29-70. Length of appendages (% SVL) : tail 191-240, foreleg 22-33, hindleg 38-53.

Nasals in contact (rarely separated). Prefrontals in contact (very rarely separated). Supraoculars 4, first 3 in contact with frontal. Supraciliaries 7 (occasionally 6 or 8). Palpebrals 9-13. Second loreal 1.0-2.1 times as wide as high. Upper labials 8 (rarely 7 or 9). Ear lobules 2-7, usually obtuse in juveniles and acute in adults. Nuchals 1-8 (mostly 2 or 3). Midbody scale-rows 26-30. Lamellae under fourth toe 21-28, each with a dark brown callus or obtuse keel.

Ground colour of head, tail and upper surface of limbs brown (tail and lower back sometimes suffused with reddish). Back and sides dark brown to blackish, with 14 or 16 white lines and stripes, often suffused on back (but rarely on sides) with brown. Line through centre of paravertebral scales from nape to middle of tail (on which it becomes broader and darker). Line through centre of adjacent dorsal scales from nape to base of tail, where it is joined by dorso-lateral line (beginning above and behind eye) and 2 lines beginning above and behind ear; resultant dorsolateral stripe on tail similar in width, extent and colour to paravertebral stripe. Midlateral stripe from below eye to middle of tail, interrupted by ear aperture, passing well above arm, and partly interrupted by thigh. Ventrolateral stripe beginning below and behind ear, partly interrupted by arm, ending at or before groin. Under surface white.

Material. Well 35, Canning Stock Route (R 3949); 28 mi. SW of Warburton Mission (R 18003); Nullie (R 20706); 64 mi. E of Cosmo Newbery (R 28821-2); 24 mi. ENE of Laverton (ERP, 45); 5 mi. NE of Duges Table (ERP, 6); 60 mi. E of Duges Table (ERP, 2); 8 mi. W of Neale Junction (ERP, 1); 18 mi. S of Neale Junction (ERP, 34); Queen Victoria Spring (R 12955, 13030, 18001).

Ctenotus atlas sp. nov.

Holotype. R 30001 in the Western Australian Museum, formerly ERP 10507, an adult male collected by Eric and Helen Pianka on 30 January 1967 at 17 miles south of Atley, Western Australia, in 28°27'S, 119°05'E.

Diagnosis. A moderately large member of the *taeniolatus* group with a total of 8 or 10 pale dorsal and lateral stripes on a blackish ground.

Distinguishable from *impar* by lack of pale vertebral stripe, and from *quattuordecimlineatus*, *ariadnae* and *dux* by having no more than one fully developed pale line between white dorso-lateral and midlateral stripes.

Distribution. The slightly more humid southwestern part of the Division, from Atley south to Woolgangie and east to Queen Victoria Spring. Extralimital in North-West Division (upper Ashburton) and western South Australia (near Lake Everard).

Description. SVL (mm): 31-68.5. Length of appendages (% SVL): tail 191-226, foreleg 22-31, hindleg 38-53.

Nasals usually in contact. Prefrontals in contact (occasionally separated in south). Supraoculars 4, first 3 in contact with frontal. Supraciliaries 7 (occasionally 6). Palpebrals 9-14. Second loreal 1.1-2.0 times as wide as high. Upper labials 8 (rarely 9). Ear lobules 2-7 (mostly 3 or 4). Nuchals 1-4. Midbody scale-rows 28-34. Lamellae under fourth toe 21-27, each with a narrow dark-brown callus.

Ground colour of back and sides blackish brown; of head, tail and upper surface of limbs dark brown. Brownish-white line through centre of paravertebral scales from nape to base of tail. White dorsolateral line from eye to proximal third of tail (on which it becomes wider and brownish). Brownish-white line from above and behind ear to base of tail. White midlateral stripe from ear to proximal half of tail, passing well above arm and slightly interrupted by thigh. Usually a total of 8 pale stripes or lines on body; occasionally 10, due either to interpolation of an obscure pale-brown line between paravertebral and dorsolateral lines or to presence of white ventrolateral stripe. Lower lips and under surface white.

Remarks. This is the species referred to by Glauert (1961 : 68) as "*Lygosoma (Sphenomorphus) leae*".

Material. 17 mi. S of Atley (ERP, 23); 10 mi. NW of Agnew (ERP, 1); 2 mi. S of Goongarrie (R 26373-4); Woolgangie (R 12744); 8 m. N of Coolgardie (R 19139); Kalgoorlie (R 10252); 12 mi. NW of Cundeelee (R 13039); Cundeelee (R 21702); Queen Victoria Spring (R 12956).

Ctenotus impar sp. nov.

Holotype. R 1333 in Western Australian Museum, an adult collected by F. R. Bradshaw in 1924 at Tambellup, Western Australia, in 34°02'S, 117°38'E.

Diagnosis. A moderately large member of the *taeniolatus* group with a total of 11 pale dorsal and lateral stripes on a black ground, including a broad whitish vertebral stripe. Further distinguishable by "capture" of anterior end of dorsolateral white line by midlateral white stripe.

Distribution. Far southwest corner of the Division. Extralimital in South-West Division (southern half).

Description. (including extralimital material). SVL (mm): 32-66. Length of appendages (% SVL) : tail 177-198, foreleg 21-28, hindleg 36-47.

Nasals separated. Prefrontals separated. Supraoculars 4, first 3 (abnormally 2) in contact with frontal. Supraciliaries 7 (occasionally 6). Palpebrals 8-12. Second loreal 0.9-1.6 times

as wide as high. Upper labials 7 (rarely 6 or 8). Ear lobules 2-5, mostly 3 or 4, second usually largest. Midbody scale-rows usually 28, occasionally 26, rarely 30. Lamellae under fourth toe 18-25, each with a wide dark-brown callus.

Ground colour of head, tail and upper surface of limbs brown. Back and sides black with following pale lines or stripes. Broad greyish-white or brownish-white vertebral stripe from nape to base of tail, occasionally split by median black line. Dorsal line of similar colour from occiput to proximal quarter of tail, its anterior extension deflecting inwards to rear of frontal and outwards along edge of frontal to prefrontal. White outer dorsal line from above eye to middle of tail (on which it becomes pale brown). White dorsolateral line from above and behind ear to middle of tail (on which it becomes brownish). White midlateral stripe extending forward nearly to ear where it forms T-junction; upper branch going above ear and forward to orbit on alignment of dorsolateral line; lower branch joining ventrolateral stripe which extends back to groin after interruption at arm. After interruption by ear aperture midlateral stripe continues forward along labials nearly to nostril. Under surface white.

Remarks. Presumably because of its 11 whitish stripes, Glauert (1961:69) identified this species with *undecimstriatus* (Kuhl). However Kuhl (1820:129) was alluding to 11 brown stripes, which implies a total of 10 whitish stripes. The specimens described by Kuhl were in the British and Paris Museums and doubtless would have been seen by Boulenger (1887:227) and Duméril & Bibron (1839:735) when they synonymised *Scincus undecimstriatus* with *Lygosoma taeniolum*.

Material. No. 5 Pumping Station, Goldfields Pipe-Line (R 8826); "Queen Victoria Spring" (R18000). [South-West Division: Mooliabeene (R 17999); "Cottesloe" (R 125-6); Bellevue (R 1775); 15 mi. SE of Karragullen (R 17998); Pinjarra (R 29229); Busselton (R 27864-5); Williams (R 4712); Narrogin (R 7765); Tambellup (R 1349, 1352, 1629, 1867, 2101, 2330); Ongerup (R 2534); Jerramungup (R 17996-7).]

***Ctenotus piankai* sp. nov.**

Holotype. R 30000 in Western Australian Museum, formerly ERP 10799, an adult male collected by Eric and Helen Pianka on 26 February 1967 at 24 miles ENE of Laverton, Western Australia, in 28°31'S, 122°45'E.

Diagnosis. A small member of the *taeniolum* group with a total of 6 white dorsal and lateral stripes on a brown ground.

Distribution. Great Victoria Desert, north to Muggun and west nearly to Laverton. Extralimital in Kimberley Division (far southwest) and Northern Territory (western interior).

Description. SVL (mm) : 30-46. Length of appendages (%SVL) : tail 190-233, foreleg 26-31, hindleg 43-49.

Nasals in contact. Prefrontals usually in contact. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 6 or 7 (rarely 8). Palpebrals 9-12. Second loreal 1.0-1.7 times as wide as high. Upper labials 8. Ear lobules 1-5. Nuchals 2-4. Midbody scale-rows 24 (occasionally 26).

Lamellae under fourth toe 19-26, each with a narrow dark-brown callus (higher proximally).

Dorsal ground colour brown, darkest on back, palest on tail and snout. White line through centre of paravertebral scales from nape to base of tail. White dorsolateral line from temples to middle of tail (on which it is suffused with brown). White midlateral stripe from ear to proximal quarter of tail. Dark interspace between dorsolateral line and midlateral stripe may be finely dotted with white in juveniles. Lips and under surface white except for darkening under digits.

Remarks. Named after Dr Eric R. Pianka, in appreciation of his intensive research on the ecology of our desert lizards.

Material. Muggun (R 15723); 24 mi. ENE of Laverton (ERP, 1); 5 mi. NE of Dungen Table (ERP, 1); 8 mi. W of Neale Junction (ERP, 5); 18 mi. S of Neale Junction (ERP, 2).

Ctenotus leae

Lygosoma leae Boulenger, 1887, Cat. Liz. Brit. Mus. 3:226. "Adelaide (T. E. Lea)."

Diagnosis. A large member of the *colletti* group with an extremely long, red tail.

Distribution. Great Victoria Desert.

Description. SVL (mm) : 39-60. Length of appendages (% SVL) : tail 240-262, foreleg 23-32, hindleg 50-58.

Nasals in contact. Prefrontals usually in contact. Supraoculars 4, first 3 (rarely 2) in contact with frontal. Supraciliaries 7 (occasionally 6, rarely 8). Palpebrals 9-12. Second loreal 1.0-1.5 times as wide as high. Upper labials 8. Ear lobules 2-5, usually obtuse or subacute, second usually largest. Nuchals 2-5. Midbody scale-rows 21-26. Lamellae under fourth toe 24-29, each with a sharp, mucronate, dark-brown keel.

Vertebral stripe from nape to proximal quarter of tail, black on back, dark brown on tail; narrowly margined with white on back and pinkish brown on tail (this margin, or paravertebral line, extends forward in a series of blotches and broken lines to frontoparietal, thence along edge of posterior half of frontal). Laterodorsal stripe from nape to base of tail, at first black, then dark reddish brown, margined below by white dorsolateral line from last supraocular to middle of tail (on which it is suffused with pinkish brown). Dark upper lateral stripe from orbit to distal quarter of tail, at first narrow and blackish brown, on side of body broad and black, on side of tail narrower and paler. Broad white midlateral stripe from loreals to thigh. Narrow brownish-black ventrolateral stripe from axilla to groin; anteriorly from arm it forks, upper and wider branch extending nearly to ear, lower branch discontinuously to below ear or a little beyond. Distal half of tail bright brownish red. Top of head dark olive grey, paler and browner on snout. Narrow white streak from orbit to temples. Narrow dark-brown streak from behind nostril to above ear, where it usually joins upper lateral stripe. Sutures between anterior labials pale greyish-brown. Under surface milky white, increasingly suffused with pink under tail.

Remarks. Apart from its coloration and slightly greater size (SVL 61.5), the type of *leae*

agrees perfectly with 17 specimens from Duges Table. Where the latter are black and red, the type is respectively dark and pale brown. These differences are almost certainly due to fading in the type; if so, it must have been collected several years before Boulenger examined it.

Material. 5 mi. NE of Duges Table (ERP, 17); Queen Victoria Spring (R 13031); 65 mi. W of Neale Junction (ERP, 1).

***Ctenotus calurus* sp. nov.**

Holotype. R 30003 in Western Australian Museum, formerly ERP 10788, an adult collected by Eric and Helen Pianka on 26 February 1967 at 24 miles ENE of Laverton, Western Australia, in 28°31'S, 122°45'E.

Diagnosis. A small member of the *colletti* group with tail blue above and white below marked transversely with black (most pronounced proximally and ventrolaterally). Further distinguishable by series of enlarged, keeled scales on sole opposite fourth toe.

Distribution. Sandy deserts south to Queen Victoria Spring and west to the McConkey Hills and Millrose. Extralimital in North-West Division (southeast of Exmouth Gulf) and Northern Territory (south).

Description. SVL (mm) : 26-49. Length of appendages (% SVL) : tail 181-238, foreleg 23-30, hindleg 44-55.

Nasals in contact (rarely separate). Prefrontals in contact. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 6-8. Palpebrals 8-12. Second loreal 1.5-2.2 times as wide as high. Upper labials 7. Ear lobules 3-5, obtuse in juveniles, more acute in adults, second usually largest. Nuchals 1-5 (mostly 3 or 4). Midbody scale-rows 24-27. Lamellae under fourth toe 20-24, each with a fine sharp keel; distal lamellae mucronate; proximal lamellae less compressed, similar to and continuous with enlarged plantars.

Back and sides with alternating black and white stripes. Widest of 9 black stripes are upper lateral and vertebral; ventrolateral narrowest. Widest of 8 white stripes is midlateral; others are lines through centre of dorsal scales. Black vertebral stripe from nape to proximal third or middle of tail (on which it is narrower and paler). Upper lateral black stripe begins narrowly behind nostril, passes through lower eyelid back nearly to end of tail, after sending branch down upper surface of hindleg. Midlateral white stripe from ear to hindleg. Black ventrolateral stripe from behind bottom of ear to groin, thence along inner surface of hindleg. Distal half of tail bright blue in juveniles, greyish blue in adults. Top of head coppery brown, variegated with blackish; paler and pinkish on snout. Lips and under surface white except for small black spots under toes and black edges to anterior subcaudals (especially prominent ventrolaterally).

Material. 37 mi. W. of Windy Corner (R 27007); 11 mi. N of Charlies Knob (R 26911); south of McConkey Hills (R 27863); 21 mi. W of Lorna Glen (ERP, 10); 9 mi. NNE of Millrose (ERP, 1); 24 mi. ENE of Laverton (ERP, 7); Yamarna (R 29219); 5 mi. NE of Duges Table (ERP, 4); 16 mi. ENE of Duges Table (ERP,

1); 8 mi. W of Neale Junction (ERP, 4); 18 mi. S of Neale Junction (ERP, 3); Queen Victoria Spring (R 12957).

***Ctenotus colletti nasutus* subsp. nov.**

Holotype. R 30250 in Western Australian Museum, formerly ERP 11331, an adult collected by Eric and Helen Pianka on 8 May 1967 at 5 miles NE of Duges Table, Western Australia, in 28°08'S, 123°55'E.

Diagnosis. A small member of the *colletti* group with tail pale brown above, entirely white below; snout concave in plan and extremely long, low and narrow; first supraocular largest; upper ear lobule greatly enlarged ("opercle-like"); prominent dark midfrontal streak. Distinguishable from *C. c. colletti* (Boulenger) of far southwest of Kimberley Division by having 5 dark dorsal stripes, of which the vertebral is much the widest, instead of 7 equally narrow dark stripes.

Distribution. Great Victoria Desert. Extralimital in Northern Territory (southwest).

Description. SVL (mm) : 34-45. Length of appendages (% SVL) : tail 192-243; foreleg 24-29; hindleg 40-49.

Nasals in contact. Prefrontals usually in contact. Supraoculars 4 (5 in one specimen), first 3 in contact with frontal, first largest (except when divided). Supraciliaries 6. Palpebrals 9-11. Second loreal 1.5-1.9 times as wide as high. Upper labials 7 or 8. Ear lobules 2 (occasionally 3), upper semicircular and much the larger. Nuchals 3 or 4. Midbody scale-rows 22-26. Lamellae under fourth toe 22-29, mostly with a fine, dark, mucronate but relatively weak keel (keels weakest or absent on proximal lamellae).

Back and sides with alternating dark and pale stripes. Widest of 9 blackish stripes are upper lateral and vertebral. Widest of 8 white stripes is midlateral; others are merely greenish or reddish white lines through centre of dorsal scales. Blackish-brown vertebral stripe from nape to end of tail (on which it becomes paler and narrower). Other dorsal stripes end on base of tail. White dorsolateral line beginning above and behind eye. Blackish-brown upper lateral stripe from anterior edge of nasal nearly to end of tail, interrupted by orbit and almost contacting upper surface of thigh. White midlateral stripe from above ear to groin. Lowest dark stripe (ventrolateral) narrow, indistinct, extending back from axilla to groin and forward above arm nearly to ear. Head yellowish brown with blackish-brown markings, most prominent of which is median streak on frontal, extending back to anterior edge of interparietal and forward to posterior third of frontonasal. Lips and under surface white except for greyish suffusion under digits.

Remarks. The specimens of "*colletti*" reported by Loveridge (1934 : 347) actually belong to *C. schomburgkii*. Glauert's concept of "*colletti*" (1961 : 69) was based on a *calurus* and a juvenile *grandis* from Marrilla and three specimens of an undescribed member of the *taeniolatus* group from Wotjulum (I have not seen his Abydos specimen).

Material. 5 mi. NE of Duges Table (ERP 12294, 13135); 65 mi. W of Neale Junction (ERP

13097). [Northern Territory : Davenport Hills (JSE 219); 21 mi. E of Sandy Blight Junction (ERP 11551).]

Ctenotus schomburgkii

Lygosoma schomburgkii Peters, 1863, Mber. Akad. Wiss. Berlin 1863 : 231 "Buchsfield, near Adelaide, South Australia (R. Schomburgk)."

Hinulia muelleri Fischer, 1882, Arch. Naturgesch. 48(1): 295. Nickol Bay, Western Australia (F. von Mueller).

Lygosoma fischeri Boulenger, 1887, Cat. Liz. Brit. Mus. 3 : 228. [Based on *Lygosoma muelleri* (Fischer), not *Lygosoma muelleri* (Schlegel).]

Diagnosis. A member of the *schomburgkii* group whose dorsal coloration is variable but never bright red; black vertebral stripe and whitish dorsolateral line always present; prefrontals usually separated; anterior preocular not in contact with subocular labial.

Distribution. North to Windich Spring, Alexandra Spring and Mt Eveline. Extralimital in North-West, South-West (northeast) and Eucla Divisions and in Northern Territory (southwest).

Description. SVL (mm) : 26-51.5. Length of appendages (% SVL) : tail 151-215, foreleg 21-31, hindleg 41-56.

Nasals usually separated. Prefrontals usually separated. Supraciliaries 4, first 3 in contact with frontal. Supraciliaries 6-9 (mostly 7, seldom 8 or 9). Palpebrals 8-11. Second loreal 1.1-2.4 times as wide as high. Upper labials 7 (occasionally 8). Ear lobules 1-5, usually obtuse, first or second often much larger than others. Nuchals 3 or 4 (rarely 5). Midbody scale-rows 24-30 (mostly 26 or 28). Lamellae under fourth toe 17-26, each with a fine, sharp, dark keel terminating in a mucron.

Eastern colour-type (based on lectotype). Head olive green. Tail olive or bronze brown. Back black with 4 greenish-white lines: para-vertebrals continuous and considerably narrower than black vertebral stripe; laterodorsals broader than adjacent black lines and apt to be broken into series of small spots. Whitish dorsolateral line extending back on to tail and forward to orbit and less distinctly along supraciliaries. Whitish midlateral line extending back on to tail and forward nearly to nasal, after bending up and round ear aperture. Between dorsolateral and midlateral lines a black upper lateral stripe from orbit to middle of tail, enclosing a series of large, pale, vertically or obliquely elongate spots suffused with red or green; represented on snout by blackish streak from nasal to orbit. Black ventrolateral stripe enclosing pale spots and extending back narrowly on to tail and forward (as a row of dark brown smudges) on lower half of upper labials. Limbs pale reddish-brown reticulated with dark brown. Under surface white.

Western colour-type (based on Atley series). Head dark olive brown. Tail pale greyish-brown. Back variously olive green, grey or brown. Black vertebral stripe from nape to proximal quarter of tail. Black laterodorsal line from upper postocular to base of tail, occasionally broken. Remainder of back variously marked with black, but usually so disposed as to leave pale margin to vertebral stripe and to form one or two lines of spots or short bars on each side. Immediately below laterodorsal line a white dorsolateral line

from temples to base of tail. White midlateral line from below eye to base of tail. Between midlateral and dorsolateral lines (and on temples as well as side of body) a series of alternating black and reddish vertical bars; represented on snout by blackish streak from nasal to orbit. Lower lateral series of bars similar to upper lateral, but not so regular and often smaller.

Geographic variation. At first it seemed possible to divide *schomburgkii* into two races on the basis of the above colour variation: a western race (*fischeri*) with dorsal pattern obscurely striped, lateral pattern fenestrate and femoral pattern striped; and an eastern race (nominate *schomburgkii*) with dorsal pattern clearly striped, lateral pattern spotted and femoral pattern reticulate. However, the presence of numerous, variously intermediate populations makes such a division impracticable.

The western colour-type, in its pure form, is confined in the Eastern Division to the far west. Immediately east of longitude 120, there begins a gradual change towards eastern coloration. Beyond longitude 124 eastern characters predominate, but even at Neale Junction (126°E) western characters are common. It is only in the northeast of the Division (and adjacent parts of the Northern Territory) that we invariably find the eastern colour-type.

Within this broad zone of intergradation, correlation is generally poor between the various characters. Round Zanthus, for example, specimens usually combine a western dorsal pattern with an eastern lateral pattern. The picture is further complicated by ontogenetic change: the tendency for juveniles to have eastern coloration, and for adults of the same population to have western.

Remarks. The four syntypes of *schomburgkii* (Berlin 4713) comprise two species. Two specimens belong to the *lesueurii* group, and two to the present species. The larger of the latter specimens (SVL 45 and 26) is here designated lectotype of *schomburgkii*.

Material. Windich Spring (R 27859); 9 mi. NNE of Millrose (ERP, 5); Wiluna (MCZ 33275); 17 mi. S of Atley (ERP, 34); 15 mi. ENE of Laverton (ERP, 1); 24 m. ENE of Laverton (ERP, 5); Yamarna (R 17269, 28783-4); 5 mi. NE of Dungen Table (ERP, 9); 3 mi. E of Stony Point (ERP, 2); 18 mi. N of Alexandra Spring (R 28861); Mt Eveline (R 17279); 50 mi. S of Warburton Mission (R 15175); 18 mi. S of Neale Junction (ERP, 6); Queen Victoria Spring and 15 mi. S (R 17267, 12238); 12 and 15 mi. NW of Cundeelee (R 13040, 21672); 10 mi. E of Zanthus (R 17283); 41 mi. SSE of Karonie (R 17337-8).

Ctenotus brooksi

Sphenomorphus leae brooksi Loveridge, 1933, Occ. Pap. Bost. Nat. Hist. 8: 95. "Perth, Western Australia (W. S. Brooks)."

(?) *Lygosoma* (*Sphenomorphus*) *taeniata* Mitchell, 1949, Rec. S. Aust. Mus. 9: 180. Andamooka, South Australia (F. J. Mitchell).

Diagnosis. A number of the *schomburgkii* group with head and back red; little or no indication of stripes; prefrontals usually in contact; anterior preocular usually in contact with subocular labial; plantar scales opposite fourth toe similar in appearance to proximal lamellae.

Distribution. Sandy deserts north to lat 23° S and west to Weld Spring, Lake Throssell and Queen Victoria Spring. Extralimital in Northern Territory (south) and (?) northern South Australia.

Description. SVL (mm) : 26-50. Length of appendages (% SVL) : tail 160-212, foreleg 23-34, hindleg 44-55.

Nasals separated or just touching (seldom forming a median suture). Prefrontals in contact (seldom separated and then usually very narrowly). Supraoculars 4 (occasionally 5, when first transversely divided), first or second largest, first 3 in contact with frontal (4 when first divided). Supraciliaries 6 or 7 (mostly 7). Palpebrals 8-12 (mostly 9 or 10). Second loreal 1.3-2.3 times as wide as high. Upper labials 7 or 8. Ear lobules 2-5, obtuse in juveniles, longer and sharper in adults, second usually largest. Nuchals 0-4. Midbody scale-rows 24-28 (mostly 24 and 26). Lamellae under fourth toe 21-28, each with a fine sharp keel terminating in a mucron.

Head and back crimson or coral-red in life, fading in alcohol quickly to opalescent green and finally to lustrous pale brown. Tail and upper surface of limbs buffy brown. Narrow vertebral stripe from neck to base of tail, blackish and sharply defined in juveniles, increasingly pale and indistinct in adults. Remainder of back with small scattered spots anteriorly tending to align, blackish brown in juveniles, much paler in subadults and barely discernible in largest specimens. Upper half of flanks with blackish-brown blotches, usually arranged in a series of about

20 irregularly vertical bars from neck to hindleg; represented on tail by brownish-grey dorso-lateral stripe extending to tip. Upper surface of limbs with greyish stripes, darker and better defined on hindleg than foreleg. Upper lips white with pale grey sutures. Under surface white (abdomen bright blue in alcohol).

Remarks. Despite its improbable locality, the type of *brooksi* clearly belongs here. The type of *taeniata* is unique in having 8 supraciliaries and weakly keeled subdigital lamellae; perhaps it comes from an isolated population.

Material. 17 mi. N of Weld Spring (R 15856); 15 mi. N of Alexandra Spring (R 28855); Mu Hills (ERP, 2); W and N of Mt Aloysius (ERP, 4); 20 mi. E of Barrow Range (ERP, 8); near Warburton Mission (R 15150, 15175, 22059); 50 mi. S of Warburton Mission (R 15173-4); 30 and 54 mi. SW of Warburton Mission (ERP, 7); near Lake Throssell (ERP, 2); 5 mi. NE of Duges Table (ERP, 28); Queen Victoria Spring (R 21699).

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